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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,032	10/31/2003	Dong-Bock Lee	SEC.1043	1092
20987	7590	03/18/2005	EXAMINER	
VOLENTINE FRANCOS, & WHITT PLLC			ALEJANDRO MULERO, LUZ L	
ONE FREEDOM SQUARE			ART UNIT	
11951 FREEDOM DRIVE SUITE 1260			PAPER NUMBER	
RESTON, VA 20190			1763	

DATE MAILED: 03/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/697,032	Applicant(s) LEE, DONG-BOCK	
	Examiner Luz L. Alejandro	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 December 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

*u*

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Hama et al., U.S. Patent 5,792,261.

Hama et al. shows the invention as claimed including a chamber structure of an inductive coupling plasma etching apparatus (see col. 13-lines 49-56), comprising: an etch chamber 16 in which an etching process is performed; a plasma chamber 18 in which plasma is generated; and a segregation wall part 14 having a portion made of quartz ceramic material opposite to the etch chamber that is a ceiling wall of the etch chamber, and having a portion made of quartz material opposite to the plasma chamber that is a bottom wall of the upper chamber, the segregation wall part separating the etch chamber from the plasma chamber (see fig. 1 and col. 3-line 61 to col. 7-line 23).

Concerning claim 2, note that the plasma chamber is an upper portion of the chamber structure and the etch chamber is the lower portion of the chamber structure.

Claims 1-3, 6, and 9-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Ni et al., U.S. Patent 6,388,383.

Ni et al. shows the invention as claimed including a cylindrical chamber structure of an inductive coupling plasma etching apparatus comprising: an etch chamber 12 in which an etching process is performed; a plasma chamber 50,52 in which plasma is generated; and a segregation wall part 34 having a portion made of quartz ceramic material 36 opposite to the etch chamber that is a ceiling wall of the etch chamber, and having a portion made of quartz material 36 opposite to the plasma chamber that is a bottom wall of the upper chamber, the segregation wall part separating the etch chamber from the plasma chamber (see fig. 1 and col. 2-line 25 to col. 3-line 38).

Concerning claim 2, note that the plasma chamber is an upper portion of the chamber structure and the etch chamber is the lower portion of the chamber structure.

Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Collison et al., U.S. Patent 6,203,657.

Collison et al. shows the invention as claimed including a chamber structure of an inductive coupling plasma etching apparatus comprising: an etch chamber 204 in which an etching process is performed; a plasma chamber 202 in which plasma is generated; and a segregation wall part 206 having a portion made of quartz ceramic material 36 opposite to the etch chamber that is a ceiling wall of the etch chamber, and having a portion made of quartz material 118 opposite to the plasma chamber that is a bottom wall of the upper chamber, the segregation wall part separating the etch chamber from the plasma chamber (see fig. 2A and its description).

Concerning claim 2, note that the plasma chamber is an upper portion of the chamber structure and the etch chamber is the lower portion of the chamber structure.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 6, and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hama et al., U.S. Patent 5,792,261.

Hama et al. is applied as above but fails to expressly disclose the chamber being of cylindrical shape. With respect to the particular shape of the chamber, a prima facie case of obviousness exists because the particular shape of the chamber would not render patentability to the claimed invention absent persuasive evidence that the claimed shape is significant.

Claims 3, 6, and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collison et al., U.S. Patent 6,203,657.

Collison et al. is applied as above but fails to expressly disclose the chamber being of cylindrical shape. With respect to the particular shape of the chamber, a prima facie case of obviousness exists because the particular shape of the chamber would not

render patentability to the claimed invention absent persuasive evidence that the claimed shape is significant.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Collison et al., U.S. Patent 6,203,657 in view of Li et al., U.S. Patent 6,009,830.

Collison et al. is applied as above but fails to expressly disclose wherein the portion of the segregation wall part opposite to the etch chamber includes a heater that heats the ceramic material. Li et al. discloses an inductively coupled apparatus including a coil 24 and a heating element 28 enclosing the coil so as to heat the chamber surfaces (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Collison et al. so as to include a heater in the segregation wall part because such a heater will allow better controllability of the process being conducted within the apparatus.

Claims 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collison et al., U.S. Patent 6,203,657 as applied to claims 3, 6, and 9-11 above, and further in view of in view of Li et al., U.S. Patent 6,009,830.

Collison et al. is applied as above but fails to expressly disclose wherein the portion of the segregation wall part opposite to the etch chamber includes a heater that heats the ceramic material. Li et al. discloses an inductively coupled apparatus including a coil 24 and a heating element 28 enclosing the coil so as to heat the

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chamber surfaces (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Collison et al. so as to include a heater in the segregation wall part because such a heater will allow better controllability of the process being conducted within the apparatus.

Claims 1-3, 5-6, 8-11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yin et al., U.S. Patent 6,352,049 in view of Collison et al., U.S. Patent 6,203,657.

Yin et al. shows the invention as claimed including a cylindrical chamber structure of an inductive coupling plasma etching apparatus comprising: an etch chamber 102 in which an etching process is performed; a plasma chamber 300 in which plasma is generated; and a segregation wall part 304 including gas flow paths and gas exhaust paths that supply process gas into the etch chamber which is made of ceramic material opposite to the etch chamber that constitutes a ceiling wall of the etch chamber, and having a portion made of ceramic material opposite to the plasma chamber that is a bottom wall of the upper chamber, the segregation wall part separating the etch chamber from the plasma chamber (see fig. 6 and its description).

Yin et al. fails to expressly disclose where the ceramic material is quartz. Collison et al. discloses an inductively coupled plasma apparatus which uses a quartz liner 116 (see fig. 2A and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify

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the apparatus of Yin et al. so as to use quartz for the ceramic material because this is a material suitable for protecting walls of a chamber from plasma damage.

Concerning claim 2, note that in Yin et al. the plasma chamber is an upper portion of the chamber structure and the etch chamber is the lower portion of the chamber structure.

Claims 4, 7, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yin et al., U.S. Patent 6,352,049 in view of Li et al., U.S. Patent 6,009,830.

Yin et al. is applied as above but fails to expressly disclose wherein the portion of the segregation wall part opposite to the etch chamber includes a heater that heats the ceramic material. Li et al. discloses an inductively coupled apparatus including a coil 24 and a heating element 28 enclosing the coil so as to heat the chamber surfaces (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Yin et al. so as to include a heater in the segregation wall part because such a heater will allow better controllability of the process being conducted within the apparatus.

Claims 1-3, 5-6, 8-11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shannon et al., U.S. Patent 6,667,577 in view of Collison et al., U.S. Patent 6,203,657.

Shannon et al. shows the invention as claimed including a cylindrical chamber structure of an inductive coupling plasma etching apparatus comprising: an etch



chamber 410 in which an etching process is performed; a plasma chamber in which plasma is generated; and a segregation wall part 304 including gas flow paths and gas exhaust paths that supply process gas into the etch chamber which is made of ceramic material opposite to the etch chamber that constitutes a ceiling wall of the etch chamber, and having a portion made of ceramic material opposite to the plasma chamber that is a bottom wall of the upper chamber, the segregation wall part separating the etch chamber from the plasma chamber (see fig. 4 and its description).

Yin et al. fails to expressly disclose where the ceramic material is quartz. Collison et al. discloses an inductively coupled plasma apparatus which uses a quartz liner 116 (see fig. 2A and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Shannon et al. so as to use quartz for the ceramic material because this is a material suitable for protecting walls of a chamber from plasma damage.

Concerning claim 2, note that in Shannon et al. the plasma chamber is an upper portion of the chamber structure and the etch chamber is the lower portion of the chamber structure.

Claims 4, 7, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shannon et al., U.S. Patent 6,667,577 in view of Li et al., U.S. Patent 6,009,830.

Shannon et al. is applied as above but fails to expressly disclose wherein the portion of the segregation wall part opposite to the etch chamber includes a heater that heats the ceramic material. Li et al. discloses an inductively coupled apparatus

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including a coil 24 and a heating element 28 enclosing the coil so as to heat the chamber surfaces (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Shannon et al. so as to include a heater in the segregation wall part because such a heater will allow better controllability of the process being conducted within the apparatus.

### ***Response to Arguments***

Applicant's arguments filed 12/22/04 have been fully considered but they are not persuasive. Applicant argues that Hama et al., Ni et al., and Collison et al. fail to disclose a segregation wall part having a portion of quartz ceramic opposite to the etch chamber that is a ceiling wall of the etch chamber. However note, for example, in Hama et al. that both the portion opposite to the etch chamber and the portion opposite to the plasma chamber 14 are made of quartz which is a ceramic material. Also, in Ni et al., both the portion opposite to the etch chamber and the portion opposite to the plasma chamber 36 are made of quartz which is a ceramic material. Additionally, in Collison et al., both the portion opposite to the etch chamber and the portion opposite to the plasma chamber 118 are made of quartz which is a ceramic material. Therefore, the Hama et al., Ni et al., and Collison et al. references read on the claims.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Luz L. Alejandro', is positioned above the printed name.

Luz L. Alejandro  
Primary Examiner  
Art Unit 1763

March 17, 2005